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ABSTRACT

This book is intended to contribute to the planning and discussion of information skills teaching as an integral part of the total school/college curriculum in Tasmania. It describes how the learning skills of finding, assessing, and using whatever information is useful or enjoyable for the purposes of thinking, communicating, and valuing can be taught as an integral part of every teacher's existing curriculum. The materials presented in the book offer a teaching approach; examples of use of the approach in the classroom; ideas for developing a whole school/college approach; and materials for use in pre-service and in-service seminars. The book's main concern is to explore different approaches to the teaching of information skills. Section 1: Teaching Information Skills contains the following chapter titles: (1) "Basic Questions"; (2) "Assumptions"; (3) "The Teaching of Information Skills"; (4) "Inquiry Learning and Information Skills"; and (5) "Implications for a Whole School/College Approach." Section 2: Classroom Activities include the following chapter titles: (6) "Inquiry Guides for Students"; and (7) "Case Studies." Appendixes include a project history and methodology and an annotated bibliography. (MG)

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Teaching students how to learn

Ideas for Teaching Information Skills

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Teaching students how to learn

Ideas for Teaching Information Skills

EDUCATION DEPARTMENT OF TASMANIA

Acknowledgements

This document is the result of a co-operative project undertaken by members of the Curriculum Centre, Library Services Branch, Division of TAFE and teachers in schools and colleges.

The initiative to undertake this project came from the Tasmanian Teacher-Librarians Association which requested the Curriculum Centre to develop a systematic approach to the teaching of information skills. The teaching approach presented in this document has been trialled by teachers in primary, secondary and college classrooms. Principals, too, made a valuable contribution to the shape and contents of this publication by critically reviewing the draft document at regional seminars arranged for this purpose.

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Foreword

This document is intended to contribute to the planning and discussion of information skills teaching as an integral part of the total school/college curriculum.

Schools are not the only places where information skills are acquired. From the moment of birth we receive and process information. Our senses continually gather knowledge from all of our experiences in the world, especially from:

- people we meet;
- books, magazines;
- electronic media.

Much of this information is absorbed almost without our being aware of it. Some of it we deliberately seek out because we need it to enable us to:

- go somewhere;
- do something;
- change ourselves in some way;
- convince or relate to others;
- make sense of previously gathered information;
- solve problems;
- satisfy our curiosity.

While we gather information from everywhere, schools and colleges are places where the process of deliberately seeking out information is stressed, encouraged and taught. Teachers are thus concerned with helping students:

- to think;
- to communicate;
- to value.

Therefore, they teach students how to find, assess and use whatever information is useful or enjoyable for these purposes. This document describes how these learning skills can be taught as an integral part of every teacher's existing curriculum.

About these materials

These materials have been written to provide support for teachers in schools and colleges to teach information skills. They offer four things:

- a teaching approach;
- examples of use of the approach in the classroom;
- ideas for developing a whole school/college approach;
- materials for use in pre-service and in-service seminars.

The main concern of those involved in producing these materials has been to explore different approaches to the *teaching* of information skills. Most existing documents do little more than identify massive lists of skills and make suggestions about how the teacher should organise them so that they can be taught more effectively. Few actually suggest *how*, exactly, these skills can be taught. It is a relatively simple matter to identify the skills; what isn't so easy is to devise effective ways to teach them.

The main purpose of this document is to help teachers do just that.

It has been published in a form which will allow sections to be photocopied easily for use in staff meetings, seminars and workshops as discussion starters. Services personnel are available to assist schools and colleges who wish to develop the approach described in this document. Requests for assistance should be made to the Superintendent of Curriculum or the Co-ordinator of TAFE Services.

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Section One: Teaching Information Skills

1. BASIC QUESTIONS
2. ASSUMPTIONS
3. THE TEACHING OF INFORMATION SKILLS
4. INQUIRY LEARNING AND INFORMATION SKILLS
5. IMPLICATIONS FOR A WHOLE SCHOOL/COLLEGE APPROACH

1. Basic Questions

WHAT ARE INFORMATION SKILLS?

Information skills is a general term which includes things known as library skills, study skills, research skills and communication skills; in fact any skill which is used in selecting, interpreting and using information in any medium. These are the skills that people need to acquire and develop if they are to become effective and independent learners. It is, therefore, more helpful to think of all these skills as learning skills rather than information skills.

An example of one of these skills is the ability to ask appropriate questions. Children usually acquire this ability before reaching school age. Another example is the ability to distinguish between fact and opinion, say by late secondary school; or at further education level, being able to retrieve information from a public data base such as ERIC.

WHY IS TEACHING OF THESE SKILLS IMPORTANT?

If quality of learning is important then the importance of teaching these skills is obvious. However, sometimes obvious things are taken for granted. For instance, when teachers are under pressure to cover course content, the ways in which this content comes to be understood by the learner (and the skills necessary to do this effectively) can be overlooked. Often, too, teachers assume that skills have been taught in previous years, or they know that they have taught them earlier. In either case it is a mistake to think that once a skill has been taught, then that is all that needs to be done.

Teaching these skills is not only important because it helps learners while they are at school or college. One of the most valuable things, some would say the most important thing, that schooling should give to students is the ability to learn and go on learning throughout life. In this way, information skills can be thought of as the most important basic skills of all and that as members of a democratic society it is everyone's right to expect that these will be taught.

With the increasing need for re-current education and job re-training, and the inevitable increase in individualised, computerised and de-institutionalised learning, it is more crucial than ever that people learn how to learn during their years of formal schooling.

WHAT DOES TEACHING INFORMATION SKILLS MEAN?

Teaching these skills means deliberately providing opportunities for the instruction and development of information skills so that students can become better learners. Sometimes this will mean the teacher will need to explain and demonstrate a particular skill, or set of related skills, as in note-making, for instance. At other times this might mean the teacher will need to provide a learning situation which will bring into use previously learned skills so that their development will be assisted through repetition and practice. In either case, the teacher will be acting deliberately to teach information skills. IN OTHER WORDS, THE TEACHER WILL BE *TEACHING LEARNERS HOW TO LEARN.*

WHEN SHOULD THESE SKILLS BE TAUGHT?

Information skills are best learned when the learner has an immediate and purposeful need for them. There is little point in teaching students how to operate a microfiche reader when they don't need to use one, or in the hope that at some unpredictable time in the future they will remember how to operate it. To teach about bibliographies when students are not required to use them is similarly ineffective yet there are many books and schemes which attempt to do just this, as if all these skills, useful and important as they are, can be taught without reference to the learner's immediate needs. Information skills taught in this way become a separate subject where the skills are treated artificially in isolation from their curricular context.

"Which skills?", "When should I teach them?" and "In what sequence?" are questions which are best answered by looking at the topic the class happens to be working on at any given time; and in particular by examining the tasks set for the students by their teacher.

IS THERE A PROPER SEQUENCE FOR TEACHING THESE SKILLS?

There is no way that information skills can be usefully listed in an optimum sequence for teaching. This is because learners vary so much in ability and readiness. Also, if skills are best taught and reinforced at the time when learners need to use them to accomplish a particular task, it is obvious that there will be as many sequences as there are learners.

DO THE SKILLS NEED TO BE RE-TAUGHT?

Yes, sometimes they do. A basic principle of effective teaching of information skills is the need for re-teaching, revising or reinforcing a skill, particularly when it hasn't been used for some time or if it is to be used in a new or different situation. Making notes from a text, for instance, is very different from making notes while listening to a talk. And making notes while listening to a talk is different again from note-making while watching a film or even making notes after the film has finished.

It is normal for a skill to be learned and then forgotten, or half-forgotten. It is normal to re-learn or brush-up a skill. We are all familiar with the saying "once you've learned to ride a bike you never forget how to do it", but if your last ride was a long time ago you will undoubtedly feel a little rusty. Your performance, to start with, will not be as skilled as it would be after a week's regular practice. Similar examples can be found in intellectual activity. Teachers who undertake study courses after a break of several years often talk about the difficulties they have in researching information, writing essays and presenting papers in seminars. This is because they haven't done it for some time and the techniques needed for more effective learning have to be rediscovered.

In the skill-learning process, repetition and practice are necessary for the maintenance and development of skilled performance. The practice, though, should not take the form of artificial exercises because the skills are then isolated from the situation in which the need for them normally arises. They become ends in themselves rather than aids to developing and presenting understandings.

The teacher's role in the re-learning, revising and refining process is just as important as it was at the time when the skills were first taught.

WHO SHOULD TEACH INFORMATION SKILLS?

Because information processing is basic to learning in all areas of the curriculum, it is part of every teacher's responsibility to teach students how best to select, interpret and use information.

The teacher, too, is in the best position to teach these skills. Every day during normal school/college activities there are opportunities for teaching information skills; that is, wherever and whenever learning is going on. Teaching and re-teaching these skills can occur and needs to occur in the day to day life of the school and college.

The classroom teacher is ideally placed and qualified to teach the information skills needed by the learners to undertake their set tasks. However, the teacher need not do this alone. There will be occasions when others can help with the teaching; other students, parents and other teachers. In particular, the special expertise of the teacher-librarian will be useful in the joint planning and implementation of the teaching approach described in the next section.

HOW DO YOU TEACH INFORMATION SKILLS?

Part 3 of Section 1 describes in detail how this can be done.

2. Assumptions

The basic assumptions on which these materials have been developed are set out below.

INFORMATION SKILLS SHOULD NOT FORM A SEPARATE CURRICULUM

Teachers need a systematic way of teaching students how to learn. However, developing a separate course in information skills, such as a predetermined library lesson program, has been shown to have limited success. In such a course the skills are taught apart from the naturally occurring circumstances in which students need to use them. Skills are not effectively learned in isolation, artificially divorced from normal conditions of need and use. Also, once a skill has been learned it may not stay learned; and a skill learned in one context may not be transferred to another.

Research and practice have shown that skills are learned more effectively at the time when learners most need them to accomplish a particular task. To be successful, the teaching of information skills must be planned as an integral part of the day to day teaching topics. The acquisition of such skills requires explanation, practice and refinement year by year and subject by subject.

Predetermining when the skills will be taught, for example, by timetabling and teaching of the use of periodical indexes to year 7, implies that skills can be meaningfully identified and sequenced without reference to the curriculum learning intended by the teacher. In this way the skills come to be seen as ends in themselves rather than as a means of developing and presenting understandings.

A sequenced skills course also ignores that:

the needs, readiness and interest of individual learners vary greatly;

skills can be acquired during unplanned and unforeseen learning experiences.

> *Isolated library lessons have failed because the skills are not introduced and reinforced across the curriculum . . . Teachers must ask themselves 'How can I teach others to learn how to learn?'*

Brake, T. *The need to know: teaching the importance of information*. Final report for the period January '78—March '79. (Report No. 5511).

EVERY TEACHER IS QUALIFIED TO TEACH INFORMATION SKILLS

The ability to locate, process and communicate information is basic to learning and thus to every teacher's curriculum. It is therefore part of every teacher's responsibility to teach students these skills in order to help them learn how to learn.

Teachers demonstrate by their successful acquisition of professional qualifications that they already have command of a broad spectrum of information skills. There are, of course, many people who can assist them with their teaching. For example, the teacher-librarian can help classroom teachers to teach some skills but the teacher-librarian should never be regarded as the sole or necessarily most appropriate teacher of them.

To support teachers, the school or college should establish a group to co-ordinate the teaching of information skills. This group would make provision for teachers to plan lessons collaboratively with each other and with specialists from outside the staff. It would also help individual subject or class teachers to grow in confidence by making time for them to share successful teaching strategies with each other.

> *Skills instruction should be co-ordinated by someone with relevant expertise and breadth of knowledge about curricular needs, and taught or reinforced by all teaching departments to ensure transferability and applicability by pupils.*

A. Irving and W. Snape. *Educating Library Users in Secondary Schools*. British Library Research and Development (Report No. J467) 1978.

3. The Teaching of Information Skills

Skills are learned in much the same way that we learn anything else and effective teaching of them needs to be based on a clear understanding of the learning process. Teachers have found the following description a useful aid to planning learning activities. The common elements of the learning process are listed in a generalised sequence.

THE LEARNING PROCESS

1. **Identification of the need**
   The learner is puzzled or curious, or is confronted with a problem which challenges understanding. The learner comes to new territory and is confronted with the unknown.

2. **Intention to learn**
   Deliberate learning arises from the learner's intention to solve a problem. For reasons intrinsic or extrinsic the learner accepts the challenge of finding out.

3. **Resource gathering**
   The learner marshalls what he already knows which may be relevant to the problem, then may ask questions of books and people, observe activities and processes and seek instruction.

4. **Idea formation**
   By trying ideas out in the imagination, through talking and writing, by modelling, etc., the learner eventually approaches 'closure' on a certain plan of action or idea.

5. **Trial of idea**
   The learner tests the idea or plan in action and evaluates its success by seeing if the problem is solved. The learner may do this by seeking the evaluation of a respected 'judge', or by comparing outcomes with the efforts of others.

6. **Reflection on outcomes**
   The learner may further modify the idea, or make minor adjustments according to consequences of the trial. By reflecting on the learning experience, the learner also may come to understand the idea more clearly.

7. **Repetition of steps?**
   The learner may repeat some of these steps one or more times.

Notes:

This is a description of how deliberate learning takes place. It does not account for such things as 'incidental' or 'accidental' learning and 'sudden insights'. However, schools and colleges are places primarily for deliberate learning and teachers, therefore, should understand how this takes place.

The phases in the learning process should not be thought of as a discrete lock step sequence but as complex interacting stages which seem to be essential in any deliberate act of learning.

The time taken for learners to go through this process will obviously vary according to the individual and what it is he is trying to learn.

THE TEACHING APPROACH

Day to day teaching topics provide a natural starting point and vehicle for the teaching of information skills. However, because there are so many skills, teachers need a way of categorising them so that they can be thought about more clearly. Unless teachers have such a set of categories it is likely that despite the best intentions the teaching of information skills will be somewhat chancy and haphazard. Teachers have found the following set of categories useful as a planning aid:

Categories of information skills

LOCATING	—identifying and finding information sources.
SELECTING	—choosing the most important, appropriate and relevant information for the set task and most appropriate media and techniques for its presentation.
INTERPRETING	—making sense of new information for yourself and others.
EVALUATING	—assessing the value of selected information and media for presentation; drawing conclusions and making judgments.
COMMUNICATING	—effectively presenting the information in whatever verbal or graphic form is appropriate.

These categories should not be thought of as a sequence or as a watertight grouping of skills. For instance, in selecting appropriate information, both selection and evaluation skills will be used concurrently. The categories are useful because they classify information skills according to their main purpose and function.

How these categories can be useful to the teacher is described in the teaching approach set out on the following pages. It consists of four stages:

- identify the main information skills needed by the students to undertake effectively the planned unit of work;
- plan how these skills will be taught;
- teach the skills;
- reflect on the outcomes.

This approach can be used by a teacher working alone or by any team of teachers.

Stages of the teaching approach

Stage One: **Identify the main information skills needed by the students to undertake effectively the planned unit of work**

The major purpose of the identification stage is to make the teacher fully aware of all the skills their students will need to undertake their set tasks. From this overview the teacher can identify those skills that are new, or need reinforcing, and which therefore, will need some deliberate treatment.

This stage must be done BEFORE teaching begins. To identify the required skills, the teacher (or teachers) will need to ask questions like:

- What are the main selection skills my students will need, or need to learn, to undertake this work effectively?
- What are the main interpretive skills my students will need, or need to learn, to undertake this work effectively?

And so on, for each of the five general skill categories listed previously.

Within each category the teacher will be able to identify more specific skills or sets of skills that the students will need. For instance, the teacher may be planning for the students to make notes. Making notes can be further broken down into specific skill components, such as the ability to identify the most important points in a body of information. Also, note-making requires different techniques and abilities depending on the situation in which they are to be made. It is one thing to make notes from written material when there is time to consider and reconsider what is important; and it is quite another to make notes while watching a film or listening to a talk.

In a year 7 unit of work on weather, the teachers identified the following essential skills that their students needed to undertake the set tasks.

LOCATING	—using an index; using a table of contents; and being able to distinguish between their functions.
SELECTING	—choosing appropriate sources, such as encyclopædias and newspapers; constructing a simple bibliography.
INTERPRETING	—skimming; note-making; summarising; interpreting diagrams, maps and statistics.
EVALUATING	—assessing the suitability of information; judging the effectiveness of an oral, written and graphic presentation.
COMMUNICATING	—writing a report; drawing diagrams and maps; presenting a talk; operating a video recorder and camera.

Whole class instruction on all of these skills was not necessary, since the students already possessed basic competence in most of them and in any case there was not time for this to take place in the four weeks allocated to the topic. Simply by providing the opportunity for their students to be engaged in these activities meant that they would be refining and developing their abilities as they worked.

Nevertheless, there were several of these skills that the teachers thought needed to be given some special treatment. Consequently, they prepared for whole-group sessions on using an index and table of contents, constructing a simple bibliography, interpreting maps and statistics and operating a video recorder and camera. These sessions took place throughout the four-week period.

As well as these planned 'lessons', several unforeseen needs arose which necessitated special sessions on particular skills with smaller groups of students.

Stage Two: **Plan how these skills will be taught**

Having identified those skills which need to be taught, the teacher, or teachers, will plan how this will be done. These plans will not necessarily be lengthy. A 'lesson' may be five or ten minutes only depending on the skill to be taught and the level of understanding of the students. Sometimes it might be an hour for teaching more complex skills or sets of related skills.

An effective principle on which to base particular teaching plans is to ensure that the skills, and the teaching of them, are made explicit. For example, a teacher wanting to begin a new unit of work in science might ask several students to prepare introductory talks on different aspects of the topic. To leave it at that is not making the skill of presenting a talk explicit. Somewhere in such a unit, time should be spent by the teacher talking with the class, or at least the chosen students, about how to prepare a talk and how to present it, two different skills.

To take the note-making example again, a very effective way for teachers to make this skill explicit is to demonstrate to their students how they do it themselves. This might be done by the teacher thinking aloud at the blackboard as she writes down the notes she would make on a particular topic. This could be done using her existing knowledge or by referring to an information source which the whole class is using. While she is thinking aloud, her students can listen to her reasoning. They will be able to hear and see how she goes about choosing the most important information and the way in which she orders it. In this way the teacher can act as a model for her students.

But there are many ways or models of processing information. Other teachers could, from time to time, also be invited to show students how they would go about making notes. It is important that the learners are exposed to many models, including those of their classmates. This activity can be done by students as well as teachers.

Regular sharing of learning techniques by teachers and learners is a good way to make the skills explicit because it enables the learners to see how others think. It encourages experimentation with new techniques and promotes the development of a wide range of skills which in turn means that students will gain greater power and independence as learners.

A year 4 teacher wanted her students to make notes from a book they were using in Social Science. She gave the students a worksheet which summarised the topic and wrote these instructions on the board:

1. *underline* the key words, then
2. *write down* other words that *you* can think of that mean the same thing, then
3. open your book and *find* these words in the index, then
4. *write down* some words from the book which tell you more about the topic, then
5. close the book. You now have useful *notes* that you can *make up* your own *sentences* about.

In a previous lesson the teacher had introduced the children to indexes and their use, so this activity of making notes was planned as a follow up. At the same time she used the opportunity to introduce two new ideas, 'key word' and 'notes'. She did this by working through the instructions using the worksheet and by asking some students to write their words on the board and explain their choice.

The plans made during this stage will be 'lesson plans' in that the teacher or teachers will need to make notes about:

where the activity will take place (classroom? excursion? library?);

who will teach and where (class teacher in the library? teacher-librarian in the classroom? parent on an excursion?);

what resources will be needed;

what the teacher will say and do with the students;

the size of the group (whole class? small group or groups?) and so on.

These plans, whether for a five- or thirty-minute lesson, are for the foreseen teaching of needed skills. Unforeseen and incidental teaching will continue to take place as it has always done, that is when the need arises during the course of day to day classroom work. Together, the planned and the unplanned teaching of skills will provide for balanced instruction in information skills.

Stage Three: **Teach the skills**

It is not possible to provide illustrations of how the teaching of skills actually takes place without using a video or audio tape. The plans included in the 'Classroom Activities' section are sufficient to give the reader an imaginary grasp of how teaching took place.

Stage Four: **Reflect on the outcomes**

The main purpose of this stage is to assess the effectiveness of the teaching of the skills. Teachers often do this informally either by themselves or with others by reflecting on 'how things have gone'. Where collaborative teaching has taken place, then the teachers can share their perceptions of the effectiveness of their teaching. Student performance will provide evidence for that. Also, talking with students about the learning techniques they use is a valuable way of providing feedback for the teacher, sharing successful methods and, of course, making the skills explicit.

Usually reflection will take place in talk. However, there are times when writing it down has particular value. Here is a teacher's evaluation of a lesson in which the skill of note-taking was taught:

The quality of notes varied – need to follow this up in gps of 4 (no more) to write-up notes and compare to see if some missed out too much.
It was unfortunate about the books, but it proved gr. 4 can effectively take notes from an ~~aural~~ oral presentation, given the necessary supports and follow-up.

"Note-taking must be preceded by note-making" – If chn cannot readily make notes from the printed word, they will find it equally, if not far more, difficult to take notes from the spoken word.

Below is a student's reflection on a unit of work on electricity:

> *It's always good to try something new in any subject. I feel I had a whole new approach to this unit, however, in some places the topics were a bit beyond me and I found it difficult to understand . . .*
>
> *. . . I think this new way is a lot better than the other way because I think that our class is too old to be spoonfed.*
>
> *Really, I don't think I learn much copying notes from the blackboard. I'd rather research things my own way because I understand it much better.*
>
> *I have enjoyed compiling this unit together, and I hope we have many more like it.*

Part of the reflection stage may include documentation of successful lessons. This documentation will already exist if the teacher has followed the approach described in the preceding pages. It would be useful for the teacher and the school to have some record of effective approaches and evaluative comments. All the teacher would need to do is to submit information in a standardised form to a central resource file which could be consulted by all teachers. The Classroom Activities section includes some examples of lessons which illustrate what form documentation might take.

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4. Inquiry Learning & Information Skills

The purpose of deliberately teaching information skills is to develop students as independent learners. When a student leaves formal, institutional education, what matters is not so much what he has learned but how successfully he is equipped to take control over his continuing education. The exponential growth rate of knowledge and technological developments, the possible need for frequent retraining to compete in the job market and the implications of increased leisure time all require capacity for change and confidence in learning new knowledge.

Schools have attempted to meet this challenge by using what is known as the 'inquiry learning' approach. As students progress through school they are increasingly engaged in research assignments and project work which enables them to practise their information skills.

The project can demand of a student a whole series of complex and subtle skills that may never be fully mastered by some learners. If a project topic is poorly defined and the rationale for undertaking it is not made explicit, the student may attempt to accumulate a mass of information without a particular focus. To make projects an effective way of learning, teachers must clearly define the purposes of the work and the nature of the tasks. For example, asking the students to 'do a project on cotton' does not provide them with adequate guidelines for processing all the information that they will find about cotton. Teachers must think about what skills their students need to practise or learn and frame the project tasks appropriately. Also, teachers should ensure that resources are available to give the information required without making unreasonable demands on students' skills and time. Setting a project assignment should take more preparation time and assistance than any other method of teaching.

> *We award the highest academic accolade to a student who can see a question, focus it into an enquiry, trace sources, find relevant information in those sources, collate the information, reorganise that information in a way that meets the question posed, and write up the reorganised material as a report. To those who achieve that pinnacle of scholarship we award a Ph.D. This same process is the one we have adopted as the main teaching method for the less academic and less well motivated school pupil, almost completely in the humanities, and extensively even in the crafts and sciences. Yet we often give no specific help. The 'project method' is felt to motivate inherently, and this motivation is supposed to solve all learning problems. No wonder projects are often feeble.*
>
> —Michael Marland, *Language Across the Curriculum*, Heinemann Educational 1977.

DEVELOPING INDEPENDENT LEARNERS

Independence in learning can be fostered from the earliest years of schooling when teachers approach it with an understanding of the skill demands they place upon their students. A young child might have the capacity to conduct a verbal inquiry and give a talk on what he has found out. By the time a student reaches year 11 or 12 he may have the skills to undertake a fairly elaborate research project, find information from a variety of sources and present his results through the appropriate media such as a video-tape, graphs and explanatory notes. Whatever level the teacher is working at, he will need to analyse the skills involved in the set assignment to find out what demands are being placed upon the student.

One way of conducting this analysis and, more importantly, of assisting students develop systematic research strategies, is to develop student inquiry guides. These are series of questions that students can ask themselves as they proceed through the stages involved in completing an assignment. Obviously, this set of questions will need to vary in language and complexity to take into account different levels of skill development and learning capacities. One of the tasks of the group co-ordinating the teaching of information skills in the school or college would be the development of a number of guides. Appropriate guides, either written or oral, can then be matched with student needs and abilities.

Below is a framework on which to build inquiry guides.[1]

- What do I need to do?
- Which resources shall I use?
- What should I record and how?
- Have I got the information I need?
- How should I present it?
- How have I done?

In the Classroom Activities Section detailed notes show how these questions can be used by teachers to develop specific inquiry guides. In the infant school, a written inquiry guide even of the simplest kind would be inappropriate to many children. In this case the same inquiry process can be conducted orally. For example, the teacher might talk through a series of simple questions with the child such as:

What do I have to find out?
What do I know already?
What questions will I ask?
Can I ask someone who knows?
Can I find out from TV/a cassette/a picture book, by looking, by doing?
Will I ask the teacher to help me write about it, or will I tell the class?

Whether oral or written, a set of logically sequenced questions such as these will provide the student with a framework for developing skills for systematic inquiry.

[1] Based on the Inquiry Framework presented in *Information Skills in the Secondary Curriculum* (ed. Michael Marland), Methuen Education, 1981.

5. Implications for a Whole School/College Approach

Teachers may readily recognise the value and strength of this approach to the teaching of information skills. However, for the approach to be implemented a number of changes may need to occur within the school or college. New approaches for using the teacher-librarian effectively and providing opportunities for teachers to plan collaboratively needs to be discussed by the whole staff. One plan of action which schools/colleges might consider using to co-ordinate the teaching of information skills is outlined below.

CO-ORDINATING THE TEACHING OF INFORMATION SKILLS IN THE CURRICULA

As it is every teacher's responsibility to teach their students the skills necessary to help them learn, it is helpful if there is a supportive framework within schools and colleges to assist them share ideas about their teaching strategies. It is therefore suggested that one person in the school should be responsible for co-ordinating the efforts of teachers in the teaching of information skills. This person can be the principal, an elected teacher or the chairman of the school's curriculum development committee. In the case of a college it is suggested that heads of departments or heads of schools assume this role as one person representing the whole college would be unworkable.

This person may set up a committee or else work with the whole staff. This group would:

- develop and share ideas for the teaching of particular skills, for example, how to teach the skill of detecting bias in a television program. Such ideas could be documented and added to the collection of examples presented in these materials.
- negotiate opportunities to free teachers from classroom commitments in order that two or more teachers may plan collaboratively. For example, a classroom teacher and teacher-librarian may co-operatively select resources to assist with the teaching of the skills of interpreting symbols.
- identify areas of priority within the curricula for the use of specialists. For example, the art teacher, the teacher-librarian or a member of the community may have better techniques and talents to teach some skills than the normal classroom teacher. By matching specialists to the teaching of particular skills, the school or college can exploit the use of human resources more effectively.

The main aim of this group of teachers is to find improved ways to teach information skills. The school or college may settle on a variety of organisational arrangements to co-ordinate the teaching of information skills. Examples of these arrangements may be:

- The year 4 teacher is currently teaching a unit of work on the history of the local community. The teacher identifies that, in order to carry out the work planned, students will need to be helped with the skill of asking appropriate questions. The teacher decides that students will each present an interview with a senior citizen on a cassette tape.

  The teacher plans the unit of work with the teacher-librarian. The teacher-librarian teaches the students how to use a tape recorder and how to record voices. The unit of work occupies four lessons with the teacher-librarian participating as a team teacher in two of these.

- The year 8 social science teacher is planning some units of work on the topic Family Life in Asia. The teacher wants some students to talk to the class on aspects of this topic. She enlists the help of the speech and drama teacher to teach the skills involved in presenting a talk. The speech and drama teacher will conduct two of these lessons in the social science classroom.

- A teacher in the commerce/secretarial studies department of a TAFE college plans to help students improve their listening skills for use in shorthand. The teacher seeks the assistance of the science/general studies teacher and librarian on how best to teach these skills. They decide to prepare some special learning materials on audiotape. The librarian assists with the recording of these materials and also with the conducting of two lessons in the library with the students.

- The special education teacher requires assistance in teaching her students to become more independent learners. The primary school staff decides to allocate a major part of the teacher-librarian's time to work as a team teacher with the special education teacher. The teacher-librarian has unique expertise and knowledge of resources to use with this group. As a team, the teachers decide that they will use the social science unit on the topic of Communicating to teach students some life skills, for example, how to use a telephone directory, understanding basic symbols and signs, accessing community groups, etc. The teacher-librarian will work with the special education teacher for five lessons each week. In addition, two lessons are to be set aside to enable them to plan together. In order for this organisational pattern to be implemented, the teachers decide to cancel some of the literature programs normally conducted in the library and to close the library for the periods that the teacher-librarian was teaching with the special education teacher.

IN-SERVICE OPPORTUNITIES

These materials provide teachers with ideas to help them discuss information skills and how they can be taught in the context of the day to day teaching topics. As such they serve as discussion starters for pre- or in-service activities. With this background of knowledge teachers can begin to discover their collective responsibilities for the co-ordination of teaching information skills in their school/college. Teachers can also use the proforma presented in the classroom activities section to document their teaching ideas for sharing with other teachers. Teachers, as a group, need joint planning time to develop a policy on skills development so that the use of skills is refined as students move through their school/college life. As mentioned at the beginning of this document, help is available to get started. Schools should contact the Superintendent of Curriculum and colleges should contact the Co-ordinator of Curriculum Services if assistance is required.

THE TEACHER-LIBRARIAN AND THE TEACHING OF INFORMATION SKILLS

The teaching approach recommended in this document encompasses the use of the teacher-librarian as a teacher. A deliberate approach to the teaching of information skills does not have to mean a formal, week by week progression in the teaching of skills. Nor does it have to mean a system of library usage based on rigidly timetabled library periods with a teaching information skills segment within each period. Close co-operation between the class teacher and the teacher-librarian is essential if the recommended approach is to be implemented.

The teacher-librarian has a role in the school/college which can be broadly classified into two service areas:

- the teaching role involved in the promotion and facilitating of the use of resources as tools for learning and self development by teachers and students;
- the librarianship role embracing the acquisition and management of resources.

Because these roles overlap, an arbitrary division of the teacher-librarian's time between them is inappropriate and misleading. The concern of this document is to provide strategies to make the best use of a teacher-librarian as a teacher of information skills. The use of the teacher-librarian 's time to participate in the planned teaching program is related to many local factors such as the amount of teacher's aide time available to the library and whether the teacher-librarian has had any experience as a class teacher.

Participating in the teaching program is not a new role for teacher-librarians. Many are already operating using the teaching approach outlined, for example, planning with teachers, teaching skills *in the context of the curriculum* and sharing outcomes with teachers.

Teacher-librarians also frequently teach in ways which are not explicitly part of the school/college's planned teaching program. They assist students find information, and provide individuals with reading programs and nurture extra curricular interests.

On the next page is a detailed description of the three ways a teacher-librarian can participate in the planned teaching program to teach information skills. The teacher-librarian can assist as:

- joint planner;
- teacher of specific skills;
- team teacher.

The joint planner

The teacher-librarian can assist teachers to identify the skills needed by students to complete a unit of work successfully and can share his experience of useful teaching strategies.

Because the teacher-librarian has a specialist knowledge of resources available both within and external to the school/college, he can play a fundamental role as a resource consultant for teaching activities involved in the use of such resources. The teacher-librarian can ensure that appropriate resources are available to students when they are needed and can advise on what resources exist to support the learning program.

The teacher of specific skills

If a need has been diagnosed by the teacher within the curricular context to teach or reinforce a specific skill, such as the use of indexes, how to make notes or how to produce an audio-tape, the teacher-librarian may be available to teach this skill. This can be done with the whole class or with a group, in the library or in the classroom depending upon the nature of the activity. The particular skills to be taught must be those which the students will need to complete a current unit of work. The way in which they are taught needs to be made relevant. For example, if a class working on geological formations was experiencing difficulty in locating information, then the teacher might decide to teach the use of indexes. This should be done by using indexes in resources which contain geological keywords.

The team teacher

The teacher-librarian will not have the time to work intensively with every teacher in every unit of work. However, the school committee or the group co-ordinating the teaching of information skills can allocate the use of the unique expertise of the teacher-librarian for special purposes. In this way the teacher-librarian will assume a full co-teaching role with a classroom teacher. The two collaborating teachers can work through the four stages of the teaching approach and:

- identify the main information skills needed by the students;
- plan how these skills will be taught;
- teach the skills;
- reflect on the outcomes.

To fulfil each of these roles effectively (particularly the latter two) the school/college needs to have developed policies and strategies on how the teacher-librarian fits into the total teaching program. To ignore the responsibility of determining this part of the teacher-librarian's role with the whole school/college is failure to recognise this person's potential for making a fundamental and powerful contribution to the quality of education. If a committee has been established, the teacher-librarian can work within the priorities set in the school/college, and will have time available to work with teachers on a planned teaching program. The information gathered by the teacher-librarian about students' information skill needs is vital for the co-ordinating committee to function effectively.

Section Two: Classroom Activities

6. INQUIRY GUIDES FOR STUDENTS
7. TEACHERS WORKING ALONE
8. TEACHERS WORKING TOGETHER

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6. Inquiry Guides for Students

This part is intended to give teachers ideas for developing Inquiry Guides to suit individual students. These can be developed from the Inquiry Framework set out on the next page.

Inquiry Guides are not intended to be used for all classroom activities. They are specifically designed for those occasions when the teacher plans to teach students how to become more independent in their learning by giving them assignment work to research. Learning to become independent does not mean that students should work alone from an early age. They will probably need a lot of adult support from other teachers, parents and classroom helpers. It is useful for these adults to have a copy of the student's guide to help them participate in developing the student's skills.

Inquiry Guides will vary in complexity according to the capacities of the user. Some students will be able to use a detailed Inquiry Guide early in their school careers: others will always need very simple versions. Students in later years of schooling and at college might have been taught to use more sophisticated information tools, such as periodical indexes and computerised systems. The detailed questions they must consider will obviously not be the same as those given to primary school students.

An inquiry guide consists of more than a series of broad questions. Each basic question, for example, *What do I need to do?*, can be broken down into sub-sets of related questions. Students who have the capacity to work without continual support and supervision will find it useful to have lists of these more specific and detailed questions included in their inquiry guides. However, an elaborate inquiry guide for students who have not acquired the skills necessary for directing their own research could be confusing. Whatever the degree of complexity in the guide, the questions will provide a focus for discussion between teachers and students and between other adult helpers and students, before and during an assignment.

On the pages following the Inquiry Framework are lists of some of the questions that could be incorporated or modified for use in an inquiry guide. In addition, there are notes for teachers to help them to frame appropriate questions and to help them analyse what is involved in the assignments they set for their students.

THE INQUIRY FRAMEWORK

A. WHAT DO I NEED TO DO?	What topic shall I choose? What is the topic? What do I know already about this topic and what must I find out?
B. WHICH RESOURCES SHALL I USE?	What sources of information exist? Am I able to use them? Where do I go first? How do I know if my source of information is appropriate? What other sources could my first choice lead me to?
C. WHAT SHOULD I RECORD AND HOW?	What is important? In what situation will I be making notes or recording information? Does the information have to be recorded mainly in writing? How should I arrange my notes or records?
D. HAVE I GOT THE INFORMATION I NEED?	What have I got? Have I got what I wanted?
E. HOW SHOULD I PRESENT IT?	In what form could I present my information? Will it suit the audience for whom it is intended? What method of presentation should I use? How should I organise it?
F. HOW HAVE I DONE?	What do I think I have achieved? What do others think I have achieved? What knowledge have I learned? What skill have I learned? What do I need to improve and how?

A. WHAT DO I NEED TO DO?

Teachers notes

A poorly asked question cannot expect a good answer.

Before setting any student an assignment, the teacher should explore the definition of the task with the student in terms of its purpose, range, depth and audience level. The student and teacher need to discuss the meaning of the terminology and alternative key words which may act as entry points. The skill of extracting key words may have to be practised.

Young children can be encouraged to have confidence in what they already know about a topic. If the topic means nothing to a child, it is probably not appropriate to assign it.

Questions for the student

- What topic shall I choose (if I am given a choice)?

- What is the topic?

  What do the words and phrases mean in this topic?

  How do they relate to each other or what exactly am I being asked to do?

  What is its purpose?

  Who will be the audience?

  How much detail do I need to provide?

- What do I know already about this topic and what must I find out?

B. WHICH RESOURCES SHALL I USE?

Teachers notes

Before setting an assignment, check that resources exist that are accessible within the constraints of the student's time and skills.

Is the student aware of the range and nature of potentially useful resources? A library book may not be the best source, rather, there might be a person to ask, or the student might learn from observation, an experiment or a video or audio tape.

Has the student location skills to access information independently? For example, can the student access a computer if this is the best source?

Has the student the skills to decide on the suitability of a resource by skimming, sampling or assessing publishing and packaging data?

Has the student the selection skills to appraise the range of resources and to know when to turn to alternative resources if the first choice is unproductive or inadequate?

Questions for the student

- What sources of information exist?

  people?

  special organisations such as libraries, museums, government departments?

  computer-based systems?

  observations from experiments or field-work?

  publications such as books, photographs, videos, kits, films, etc.?

- Am I able to use them?

  Have I got time to make use of them?

  Have I got the skills to access them?

  For example, can I use a catalogue, a periodical index, a computer, or can I conduct an interview?

- Where do I go first?

- How do I know if my source of information is appropriate?

  Is the scope too wide or too narrow? What does it say on the title page, the contents list or packaging?

  Is the level too simple or too complex? Do I need to sample much of the contents?

  Is it relevant? Will the index help me?

  Is the author or editor a known authority? Can I find information on these people?

  Is it reliable?

  Is it accurate? When was it published?

  Is it biased?

- What other sources could my first choice lead me to?

  Is there a bibliography?

C. WHAT SHOULD I RECORD AND HOW?

Teachers notes

Note-making is an idiosyncratic skill. How notes are made is not as important as their relevance and their scope and how easily the information in them is retrieved. The use of quotations in lieu of paraphrasing or summary requires correct methodology and the skill of judging their appropriateness within the confines of content and task.

Questions for the student

- What is important?

  What did the original task demand of me?

  Can I change the topic now, if I have become interested in finding out more about another topic or aspect of the topic?

- In what situation will I be making notes or recording information?

  Do I have plenty of time or not? For example, will I be making notes from my own book, a book on short term loan, a film, or a speaker?

  Will a cassette recorder help me?

- Does the information have to be recorded mainly in writing?

  Can I also:
  take photographs
  make models
  make a tape recording
  make a diagram or table
  memorise?

- How should I arrange my notes or records?

  Have I got good key headings?

  Do I want to use number and alphabet systems to make the main points and related parts?

  Do I want to include quotations with bibliographic details or a bibliography?

  Do I want to keep them in a folder, a file, a card index or a mixture of ways?

D. HAVE I GOT THE INFORMATION I NEED?

Teachers notes

This is a review stage where the student is required to interpret the information gathered, analyse it, transform it into a personal statement and evaluate it in relation to the original task. Students may need to be re-assured that it is acceptable and often necessary to go back and repeat the search until the results are satisfying.

Questions for the student

- What have I got?

  Is there information to fit all my key headings?

- Have I got what I wanted?

  Does the information I have found enable me to answer all aspects of the original question?

  Have I got information that is out of place and unnecessary for this task?

  What is missing?

  Where will I go to continue the search?

E. HOW SHOULD I PRESENT IT?

Teachers notes

While a creative and inventive approach to deciding on a format is to be encouraged, it is crucial that the student develop a sense of audience and tailors the presentation to suit an appropriate level and need for detail, for example, audio-visual presentations may be a valuable way of recording historical sequence, displaying visual images of topics under discussion or dramatisation to highlight points of argument but may not be suitable for conveying technical detail or analytical argument.

Deciding on the method of presentation, understanding the conventions involved, constructing an appropriate framework, and knowing what to leave in and what to leave out are highly complex skills requiring repeated discussion and practice.

Sequencing thought in a variety of ways involves skills of classification and an awareness of logical connection and argument that frequently can be practised in verbal debate.

Questions for the student

- In what form could I present my information (if I am given a choice)?

  Does it have to be an essay or written report?

  What about:
  a video-tape
  a slide-tape presentation
  a talk
  a photograhic essay
  a model
  a mixture of formats?

- Will it suit the audience for whom it is intended?

- What method of presentation should I use?

  Will it be a simple description or account?

  Do I want to illustrate or apply an idea, problem or principle?

  Will I be discussing an issue?

  Am I debating the pros and cons?

  Am I analysing, interpreting or criticising?

  Am I presenting an argument or making a case?

  Am I comparing and contrasting?

- How should I organise it?

  How shall I introduce it?

  What order or sequence is best? Should it be chronological, geographical, from the general to the specific or in another way?

  Should I use sub-headings and/or number sections?

  How shall I finish my presentation?

  Should I acknowledge my sources?

F. HOW HAVE I DONE?

Teachers notes

Evaluation, not only of the final product, but especially of the inquiry process and the skills involved is an essential part of developing a student's information skills.

Evaluation of the student's performance by the teacher will inform the student of those learning skills that need to be re-taught or practised.

Self-evaluation on the student's part is crucial to his development of life-long learning skills.

Questions for the student

- What do I think I have achieved?

- What do others think I have achieved?

  What does my teacher think?

  What does the examiner think?

  What do other students think?

  What does my audience think?

- What knowledge have I learned?

  What did I learn about the topic?

  What did I learn about useful sources of information?

- What skills have I learned?

  Have I improved the way I go about an assignment?

  Have my particular techniques improved, for example, in using reference books and catalogues or in sequencing my thoughts?

- What do I need to improve and how?

7. Case Studies

(a) Teachers working alone

(b) Teachers working together

The purpose of the case studies that follow is to illustrate how the approach to teaching information skills outlined in these guidelines has been put into practice.

The examples of teachers working alone to implement the teaching approach came from a senior secondary college. Examples of collaborative teaching came from a primary and a district high school. However, the subject and level of these case studies are, to some extent, irrelevant. Teachers who want to try this approach will be able to find useful ideas in all of them.

For practical reasons, all the chosen case studies have been edited to fit a fairly tight format. Teachers who would like more details and who would like to look at more examples can contact the Superintendent of Curriculum or the Co-ordinator of Curriculum Services (TAFE).

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CHEMISTRY
Years 11/12

Two lessons on objectivity and accuracy in conducting and reporting on scientific experiments were taught by a single teacher.

Stage One: **Identify the main information skills needed**

Selecting
- Accurate observation from an experiment.

Interpreting
- Objective analysis of experimental results.

Communicating
- Precision of language when writing reports.

Stage Two: **Plan how these skills will be taught**

The teacher prepared examples of "typical" students' reports of an experiment and statements of scientific facts. The students were to be placed in the teacher's role of making corrections with whole group analysis of the results.

Stage Three: **Teach the skills**

The teacher gave an introductory talk about the objectives of the lessons, emphasising that these lessons were designed to help the students improve their achievements in science. The results would not be included in any assessment.

The students undertook the correction exercise in the first lesson.

The second lesson was involved with lengthy discussion of the results and generation of other examples.

Stage Four: **Reflect on the outcomes**

Students expressed appreciation of the exercise and admitted that the typical "mistakes" they were correcting could easily have been their own.

The teacher felt that, while most science teachers stress objectivity and accuracy in recording and interpreting experimental results, this is usually done in the form of "asides" to the main work. Such a method does not guarantee the involvement of all members of the class. The active concentration of students on these problems has had positive outcomes. Students respond better to subsequent "reminders" that care is needed to maintain objectivity and accuracy in their use of language. Normal assessment tests have since included one or two of the "correct the error" type question to monitor progress, with encouraging results.

In the future, the teacher would introduce specific skill teaching earlier in the course but only after suitable work had been covered to make the purpose of the exercise meaningful. It would not be difficult to construct simple questions on almost any part of a practical scientific course to provide the focal point for the necessary awareness and remedial action. A pool for such questions could be devised and refined to make the initial exercise as effective as possible and to provide for continuous monitoring of progress.

SOCIAL PSYCHOLOGY
Years 11/12

A two-week unit on *Ethnic Groups in Australia* was taught by a single teacher using guest speakers invited by students.

Stage One: **Identify the main information skills needed**

Selecting
- Formulating questions.
- Taking notes from a speaker's talk.
- Making notes about a topic.

Communicating
- Asking questions of a speaker.
- Relating to fellow students in small groups.

Stage Two: **Plan how to teach these skills**

The teacher decided that an introduction to the subject content was necessary.

To teach the specific skill of formulating questions, the teacher considered it was helpful to ask students how they would answer the questions they had set.

To assist students gain skills in listening to a speaker, the teacher decided it would be more manageable if each student was required to concentrate on listening to one component of a culture only, for example, family, religion. No specific plans for teaching the skill of note-taking and note-making were made.

Stage Three: **Teach the skills**

The teacher presented a formal lecture on the main components of a cultural system that may be seen in any ethnic group. In the second lesson the teacher divided the class into small groups and each group was asked to select a particular ethnic group to research. In this lesson the teacher gave each student in a group one component of culture to concentrate on. The teacher then outlined the characteristics of good questions including the consideration of the following points:

What information are you seeking?

How much detail do you require?

What is the purpose of the question?

If you asked yourself the same question of your culture, could you answer it?

Each group was required to organise and present their session and introduce their guest speaker to the rest of the class.

Students in the class were then required to take notes in their allocated subject area, for example, family, religion, etc.

The teacher discussed briefly, points related to taking notes and making notes. Students were then left to organise the sessions themselves.

Stage Four: **Reflecting on the outcomes**

On the completion of the project the teacher talked with small groups of students about how they felt about the project and the worth of having visiting speakers.

Questions put to the small groups for discussion were as follows:

Questioning:
What do you think you've learnt about asking questions?

How do you feel about asking the speaker for information (when you are actually doing it)?

Do you think there was any value in pre-planning your questions?

Note-taking:
How do you decide what to write down?

How do you feel when you are taking down notes?

What is the most difficult part of note-taking?

How do you decide the most important points to record?

Did you find it difficult to make notes and listen at the same time?

Did you listen all the time?

Did I [teacher] make it clear enough what I wanted you to do — during the tasks — in the whole project?

Students' comments

Responses from the groups, both verbal and in writing, are summarised as follows:

The prepared questions were useful *"because we were very nervous and different speakers took different directions in their talks." "We learned to have very specific questions and ask them in a clear voice."*

Each person being responsible for a specific area was helpful. *"You listened for points in your area and it didn't matter if you missed other parts the speaker said because someone else would be listening for that."*

This aspect made taking notes easier, too. *"You didn't try to write down everything, that is, knowing exactly what you're listening for helps."*

Inflection and method of presentation of some speakers' voices helps *"to separate material and to decide what is important."* For example, the speaker saying: *"Now take the family in Poland."* It is *"easy to pick out if its your area by the stresses used by the speaker."*

The speakers *"were interesting characters". "This helped keep your concentration because it got you interested. Especially better than just reading research."*

Members of the group were encouraged to ask their questions by being individually responsible for one specific area, (i.e. group sharing, group goals, etc.). *"Made it easier."*

Visual information brought by speakers was helpful. *"You could remember it later."*

Needed more time for preparing the questions. *"Many were too general and the speakers did not know how to answer them."*

Needed more time to actually ask all questions prepared. *"Speakers should come with little or no prepared talk – just answer questions." "This* [questions] *was more useful than the speaker lecturing because it gave the material you wanted to know."*

Needed more than one contact with the speaker – *"more relaxed, informal exchanges, which are not possible with only one session." "Possibly two–three sessions."*

Some speakers were difficult to understand.

Teacher's comments

Many of the students' questions lacked refinement in not being specific enough.

There was insufficient time for all questions to be put to the speakers by the students.

The students notes were satisfactory. They had practised this previously and could easily select relevant information being responsible for just one or two main areas.

If I did this again I would plan for more time to let students pre-plan questions and to provide for more than one session with each speaker. I would request speakers to spend more time responding to questions and less to just teaching.

The students needed more time for reflection especially about their note-making techniques. For example, do students have criteria for good note-taking and should we examine strategies for note-takers, for example, verbal cues, points stressed, information or repetition?

The technique of division of areas and individual responsibilities in a group situation yielded interesting reactions and could be followed up.

In conclusion, too many skills were considered together instead of concentrating on one or two specific ones, for example, making notes from the speaker. No skill is in isolation, but there were still too many here to consider precisely.

MATHEMATICS
Years 11/12

A teacher taught two lessons on problem-solving techniques in mathematics.

Stage One: **Identify the main information skills needed**

Selecting
- Identifying the best approach to solving a problem.

Communicating
- Presenting solutions to a problem in a clear and logical form.

Stage Two: **Plan how these skills will be taught**

The teacher identified four different techniques familiar to the class and prepared three tests, each containing four questions, one on each technique. The planned lessons are detailed below.

Stage Three: **Teach the skills**

LESSON 1

The teacher explained to the class what was to be taught and asked students to give reasons why the skill of presenting solutions in a clear and logical way was necessary.

The class took the first test, which was marked in class, as a basis for discussion. On the blackboard they were then given a list of four available techniques.

The class divided into six groups, each of which worked on the solution to a different problem. These solutions were presented to the class for comments and criticisms.

The students were given the second test which asked for a technique to be chosen for each problem, not an actual answer.

LESSON 2

After a brief reminder of the previous day's work, the students tackled the third test to reinforce the skill that was being taught.

Stage Four: **Reflect on the outcomes**

The teacher found that students were immediately interested in the aim of the lesson, clearly recognised the need for such a skill and sustained interest throughout.

Comparison of the first and third test results showed a marginal improvement.

Group work and class discussion were good and produced fruitful comments.

The teacher, in teaching this lesson again, would lay greater stress on the reasoning process. That is, students would be asked to explain now only which technique they would choose but why they chose it — what was in the question which indicated the technique (key words, ideas, etc.). The teacher would emphasise that a solution cannot be logically presented unless the question is completely understood.

RELIGIOUS STUDIES
Years 11/12

The topic *History in the Gospels* was taught in four lessons by one teacher.

Stage One: **Identify the main information skills needed**

Interpreting
- Analysing a question.

Selecting
- Objective listening.
- Note-taking (from a lecture).
- Note-making (from a written document).
- Selecting information from visuals (slides).

Communications
- Writing an essay.
- Working in small groups.

Stage Two: **Plan how these skills will be taught**

The teacher decided to use a series of sequenced steps designed to move students from information to understanding. Two steps were to involve the "modelling technique" where students were to be shown answers the teacher would give. Small discussion groups were used to focus the information, with tape recording of some discussion to assist reflection on outcomes.

Stage Three: **Teach the skills**

LESSON 1

A 10-minute introductory talk was given explaining to the students that the teacher was involved in a project designed to discover better ways of helping students receive and communicate information. The teacher said he was concentrating on the skills of: 1) analysing questions; and 2) picking out the most important and relevant information from a lecture and a written document. Volunteers were chosen to join the group to be tape-recorded.

The lecture topic *The New Testament Gospels are primarily theological books. Therefore, although they are based on history, they should not be relied upon as being historically accurate*, was given to the students and the teacher discussed the broad emphases his lecture would take. The students divided into groups to discuss what the main points of the lecture might be.

The first part of the lecture was then given.

LESSON 2

The second part of the lecture was given.

The lecture was illustrated by a series of slides.

The groups discussed the most important and relevant points of the lecture and were then shown the list of what the teacher considered most important for comparison.

The students were given a handout on the *History of the Gospels* and an essay topic.

Homework was to read the handout, analyse the essay question and extract the most important points needed to answer the question.

LESSON 3

In small groups and as a class they discussed their findings.

Students were asked to evaluate what they had learned and how they felt about the teaching strategy.

Homework was the preparation of one A4 page of notes to bring for the essay writing lesson.

LESSON 4

The students wrote their essays.

Stage Four: **Reflecting on the outcomes**

Essays were marked and marks were compared with previous essay marks. It was noted that while some of the weaker students had gone down, more of the weaker students showed the strongest improvement. Other groups of students registered a slight overall improvement.

Student evaluations were collected. Opinions of these students about the teaching strategies were widely mixed. Those with poor opinions of this way of teaching did less well than those who saw value in it.

Listening to the tape-recordings gave the teacher valuable insights into how students tackled problems and how they might be helped in the future.

The teacher considered there was much room for improvement in relation to:

1) selection of the most important and relevant information;

2) cognitive understanding.

SOCIAL SCIENCE
Year 4

The teacher and teacher-librarian taught a unit on *Tasmanian Aborigines* over a four-week period.

Stage One: **Identify the main information skills needed**

Location
- Using key words as a location guide.

Selection
- Defining secondary subject headings and key words.
- Note-taking.

Interpreting
- Note-making.

Stage Two: **Plan how to teach these skills**

LESSON 1
Children were to be taught how to extract key words from the main topic and understand their importance for retrieving information via the reference book used (*The First Tasmanians*), dictionaries, whiteboard and a work sheet.

LESSON 2
Research procedures from Lesson 1 to be reinforced and developed with emphasis on thesaurus construction.

LESSONS 3 AND 4
Children were to be taught the skills of note-taking from an oral medium using their knowledge of note-making.

Stage Three: **Teach the skills**

LESSON 1
Children discussed the topic and the processes they would have to go through to find information. They selected key words and assembled secondary subject headings. Dictionary use was encouraged throughout to check meanings of words.

The class was divided into groups of four and each group given a copy of the reference book. Groups worked on analysing the structure of the book in terms of retrieving information, for example, the use of the Table of Contents and the Index. With support from the teachers and each other they made notes from the book on various sub-topics.

LESSON 2
The class revised methods of accessing information learned in the first lesson.

They were given a worksheet, with instructions to find key words on it which could be used to access information in their reference book. They made brief notes from the reference book which they developed into their own sentences.

The teacher-librarian emphasised the building-up of a word-list and its importance in creating a framework in which to identify alternative phrases/words with same or similar meanings.

LESSON 3
Instead of having direct access to their reference book, the class divided into two and the class teacher and teacher-librarian read relevant portions of the book to the class.

Children were instructed in note-taking (transfer of note-making skills):
(a) working out sub-headings (note format);

(b) listening for key words, phrases relating to each sub-heading.
(c) writing these down quickly — abbreviations (own code for notes — making sure the legend explaining each abbreviation is clearly at the top of the page of notes);
(d) keeping notes brief, succinct.

Teachers then read relevant portions (assisting note-taking procedure by providing necessary spellings, or occasionally repeating key words). Notes were checked.

Children were instructed in the need to write-up notes in sentences as soon as possible, while they were not tired or distracted.

LESSON 4
Children's notes were written up into draft sentences. Teachers checked drafts for sequencing, spelling, punctuation, grammar and accuracy.

Stage Four: **Reflect on the outcomes**

LESSON 1
1. Defining topic.
Good comprehension but children needed direction in *layout* of subject headings on paper to allow for notes later on.

2. Accessing information.
Concentrated on use of index — the term "distribution" needed to be looked up. Essentials grasped well.

3. Locating and selecting.
Children grouped in fours at each table with one book per table — raised need to co-operate. Most coped very well with this and helped each other in note-making.

Used whiteboard to explain use of natural features as tribal boundaries.

Pictorial representation reinforced earlier (oral) discussion.

LESSON 2
1. Children worked well and all that was planned to be covered was so.

2. Word-list (thesaurus).
Children responded well. Need practice in thinking of alternatives — working in groups proved very positive in this regard.

3. Needed assistance (weaker ones) in selecting *relevant* information — generally this was very well done with the word-list assisting in this selection. Again working in groups of four with only one book per group enforced group co-operation — positive results. Sharing in this way is important at this stage of learning a new procedure.

LESSON 3
The quality of notes varied — need to follow this up in groups of four (no more) to write-up notes and compare to see if some missed out too much.

The exercise proved grade 4 can effectively take notes from an oral presentation, given the necessary support and follow-up.

"Note-taking must be preceded by note-making" — If children cannot readily make notes from the printed word, they will find it equally, if not far more, difficult to take notes from the spoken word.

LESSON 4
This follow-up was not able to be done the same day as the previous lesson. This detracted from the reinforcement of transferred skills to make sense of notes, as writing-up, in some cases, was incomplete.

This aside, most were sequenced correctly and accuracy was reasonable, given the time-lapse. This provided the opportunity for children to go back to the book to check, thus reinforcing evaluating and interpreting skills.

SCIENCE
Year 7

The topic to be studied was *Air, Atmosphere and Weather.* Students were asked to do research projects on various aspects of the unit (PART I), then to make a video of a segment of a science program based upon *The Curiosity Show*, (PART II). They were taught by their class teacher, the teacher-librarian and a teacher with expertise in video-filming.

PART I (Research Projects)

Stage One: **Identify the main information skills needed**

Locating
- Using an index and table of contents.

Selecting
- Constructing an annotated bibliography.

Evaluating
- Assessing the suitability of information for the task specified.
- Discussing findings with whole group and teacher.

Stage Two: **Plan how these skills will be taught**

The class teacher and the teacher-librarian decided that the class teacher was to give an introductory lesson on the topic. The teachers were then to select material to present to the students in the library for them to work on their specified research tasks. Each student was to be given a sheet outlining the required project. The teacher-librarian was to ask each student to take a book, and using these materials, talk with the students about using the table of contents and index to locate information.

The students were to search through the materials until they found some information relevant to their topic. They were then to record bibliographic details, page numbers and notes about the content.

The teacher-librarian was to assist each student individually to learn ways to evaluate the information found in terms of the set task.

The class was to discuss what had been learned about information retrieval with the teacher.

Stage Three: **Teach the skills**

Stage Four: **Reflect on the outcomes**

The exercise was fairly successful. Students, at first, were a bit hesitant and were not quite certain what to do but as the period progressed they settled into it well. Most students began working individually but towards the end of the unit they began working in groups and sharing their information.

By the end of the period almost all the students had grasped the method of compiling bibliographies. All were using indexes and the table of contents efficiently. Many were rejecting certain books as either too difficult or not quite what they wanted.

One way in which the exercise might be improved would be to structure the bibliography more, i.e. by drawing up a chart such as the following:

Author	Title	Page	Notes

Evaluation skills still need working on.

PART II (Video Tape)

Stage One: **Identify the main information skills needed**

Selecting
- Choosing main topics for the video and the information to be included.
- Choosing suitable diagrams, experiments and appropriate apparatus.

Evaluating
- Testing and refining the script using an audio-cassette.

Communicating
- Operating equipment.
- Writing instructions for the camera operator.
- Writing the script.
- Producing a clearly typed document.
- Working in front of the camera.

Stage Two: **Plan how these skills will be taught**

The class teacher and teacher-librarian were to assist the students to select headings for the program then to work out what was to be done for each heading. Work was to be done on selecting diagrams and experiments suitable for a video production and analysing the apparatus needs. The students were then to practise script-writing using an audio cassette recorder to refine the technique. They were then to write a video-script, including instructions for the camera operator. The art teacher, who had expertise in using a video camera, was to assist with the filming.

Stage Three: **Teach the skills**

The planning was modified during the teaching process as an original idea of producing a weather forecast was too difficult for the students.

Stage Four: **Reflect on the outcomes**

A realisation of the difficulties involved in the project lead to the teachers and class narrowing the focus of presentation.

The teachers had under-estimated the time the unit would take and the students did not eventually produce a very polished tape. Those students who worked well in the preparation stages retained knowledge of the content of the topic and the skills they had used in the production. Students who were less motivated found the exercise very difficult. One student was seen to have progressed from being quiet and reserved in front of the camera to being at ease and communicating fluently.

Appendix A: Project History & Methodology

In 1981 the Tasmanian Teacher-Librarians' Association requested the Curriculum Centre to develop a systematic and coherent approach to the teaching and learning of information skills. Subsequently, a State Working Party was formed comprising members of the TTLA, the Curriculum Centre and Library Services Branch to produce guidelines for the teaching of information skills from kindergarten to year 12 — TAFE.

The working party identified several questions fundamental to the project:

What are information skills?

What information skills exist in the curriculum?

How are these skills introduced, taught and developed?

What is the best way to teach these skills systematically?

What is the role of the teacher-librarian in the teaching of information skills?

An interim statement called THE INFORMATION SKILLS PROJECT WORKING DOCUMENT NO. 1, MAY 1982, was produced representing the Working Party's endeavours during 1981. The greater part of this document detailed one approach to the teaching of information skills by identifying and organising them into a sequence for optimum introduction.

The writers pointed out in the document that the Sequenced Skills and Content Approach, although representative of a stage in the evolution of the project, had many inherent problems.

These problems included:

- the difficulty of compiling a comprehensive list of skills;
- the difficulty of attempting to sequence these skills. It was impossible to accommodate broad variations in students' readiness to learn. Such a sequence also ignored the need to reinforce and refine skills through recurrent teaching;
- the suggestion that isolating "library lessons" from the current curriculum learning of the students was an effective way to teach these skills;
- the danger of implying that these skills were a subject requiring their own curriculum rather than a fundamental part of any teaching program.

The Working Party identified two alternative approaches to the learning of information skills in this document and noted their intention to explore them.

These approaches were:

(i) An Information Source Approach
(ii) A Curriculum Needs Approach.

The *Information Source Approach* was based on the premise that the teaching of information skills could use as a starting point or vehicle, such resources as newspapers, encyclopedias or people. These could act as points of cohesion for a range of subordinate skills such as alphabetising, note-taking, preparing reports etc. This approach was seen to have some validity when based on a curricular assignment requiring access to a 'closed' information field, e.g. the student is asked to gather information from a newspaper or a computer. However, as a basis for the teaching of information skills, once again the danger of isolation from classroom curricular needs made this approach unacceptable to the Working Party.

The central tenet of the *Curriculum Needs Approach* was that information skills do not exist in isolation. As a general term embracing what are sometimes known as 'library skills', 'study skills', 'research skills' and 'communication skills', they are probably best considered as *learning skills*; a means of selecting, interpreting and using information and not an end in themselves.

The project then became primarily an exploratory one, focussing on how learning skills are taught, who teaches them and in what context. In this sense the innovatory nature of the project required several methodological approaches. Research was aimed at gathering the widest possible information base and at analysing teaching practices. Thus two main sources were used — published literature (overseas and local) and action-based research using teachers and librarians in the classroom.

In the first instance the Working Party identified references to the teaching of study skills, information skills, survival skills etc. in recent Education Department of Tasmania reports. These reports included:

Committee on Primary Education (COPE Report)

Tasmanian Education in the Next Decade (TEND Report)

Secondary Education in Tasmania (SCOTT Report)

Requirements for a Curriculum

Report on the Careers Education Working Party

Although these reports highlighted the need for students to acquire these kinds of skills, they did not say how these skills could be taught systematically. However, the reports did emphasise that they needed to be taught in conjunction with the existing curricula and some argued the dangers of setting up new and separate curricula.

The Working Party also located reports and results from research groups working overseas, in particular the work of the British Library *Need to Know* project. The project's officer, Terence Brake, concluded that schools wishing to teach information skills should first formulate whole school policies towards the teaching of them.

The Schools Council of London also produced a publication entitled Information Skills in the Secondary Curriculum which includes some practical guidance for teachers in setting learning tasks for students.

The Working Party also conducted three school- and college-based projects to gather data for these materials. It was decided to gather information using an action-research approach since experience has shown that teachers will come to improve their teaching by seeking answers to questions that they have raised about their own practice. It also means that teachers are more likely to be open to others who have explicit or implicit theories. Such exchanges may lead to further strengthening or modification of the teachers' own theories and practices.

These materials have been trialled by practising teachers in their own classrooms and submitted to principals at special seminars for their critical comments.

Appendix B: Annotated Bibliography

The following four documents reveal how concern about the teaching of information skills in Britain has grown from broad concern to specific educational recommendations. The latter two titles were of particular value to the writers of the "Teaching students how to learn" materials.

Department of Education and Science

A language for life. Report of the Committee of Inquiry appointed by the Secretary of State for Education and Science, under the chairmanship of Sir Alan Bullock.

London: HMSO, 1975.

This report recognised the importance of teaching the skills needed to deal effectively with information and allocated responsibility for developing these skills to classroom teachers.

IRVING, A. and SNAPE, W.H.

Educating library users in secondary schools. British Library. Research and development reports, No. 5467.

London: British Library, 1979.

An investigation into systematic teaching of information/library skills in the secondary school, this report found that information skills programs should be intensified and extended to cover sixth-form students. Irving and Snape were concerned that school librarians were not always full members of the educational teams in their schools. They often had inadequate relief staffing over lunch and recess times. They needed support for in-service education programs and participation in curriculum planning meetings.

BRAKE, Terence.

The need to know: teaching the importance of information. Final report for the period January – March 1979. British Library. Research and development reports, No. 5511.

London: British Library, 1980.

Report on a project based at a South Hackney school investigating:

What sort of information do young people need while at, and when they leave, school?
What information sources are able to supply the relevant information?
What information skills should pupils acquire before leaving school?

Brake recognised that teaching students the importance and use of community information in the management of everyday life could not be done in a social education course "patched on to the curriculum before the pupils leave school. Any school wishing to teach a programme based upon, or in the same area as 'The Need to Know' should first formulate a whole school policy towards the teaching of information/study skills".

MARLAND, Michael (ed.)

Information skills in the secondary curriculum

London: Methuen, 1981.

This is offered as some practical guidance to teachers in the development of a teaching program for information skills. The emphasis is on the secondary curriculum but the general principles are applicable to learning tasks given to all students. The working party developing this document stressed

the need for a whole school policy and they give detailed suggestions for schools to use in their own staff workshops. The use of the term "information skills curriculum" is somewhat misleading as the approach advocated stresses the integration of teaching skills and subject content. One of the main concerns of the document is to provide guidelines for making projects/assignments an effective vehicle for teaching information skills.

The British Schools Council considered this document so important that it has distributed copies to all secondary schools in England and Wales.

There are numerous documents criticising institutionalised education today and expressing concern about how students are equipped to take control of their continuing education. The following two books lay particular emphasis on students' needs to learn, not so much subject content, but the skills to find out for themselves.

HEMMING, James

The betrayal of youth: secondary education must be changed

London: Boyars, 1980.

Hemming believes that schools over-emphasise the academic curriculum which does nothing for the confidence of three-quarters of students. He also claims that the "master-minds of tomorrow will not be those who retain within their heads, for instant recall, masses of factual information but the people skilful at selecting and relating information".

HUSEN, Torsten

The school in question. A comparative study of the school and its future in Western societies.

Oxford University Press, 1979.

A comparative and a critical study of institutionalised schooling, raising serious questions about the relationship between schools and a changing society. It emphasises the need to teach "skills and concepts that are applicable to a broad and largely unforeseen range of situations" rather than specific competencies.

Books giving ideas on how to organise and refine study methods have, of course, great value to self-motivated learners, such as adults, wanting to improve their skills. Students in primary and secondary school and even colleges usually have great difficulty in tackling the development of their learning skills in an abstract way divorced from day to day learning. However, teachers can use such books to great advantage for getting ideas to use with their students. The books below, although very different in style, both give interesting insights into how we learn and what strategies we can use to improve our learning.

FENKER, Richard M.

Stop studying, start learning: or how to jump-start your brain

Fort Worth, Texas: Tangram, 1981.

The author is a professor of psychology who also teaches learning skills to high school and college students. Despite the gimmicky approach and rather desperate humour, the book offers valuable information about the operation of the human brain and learning strategies. It would be helpful to anyone above year 10 seeking to improve learning skills and for secondary teachers wanting to develop activities to help their students become better learners.

FREEMAN, R.

Mastering study skills

Macmillan, 1982.

Like Fenker's book, this course in study skills is relevant to post-year 10 students and particularly to adult learners coming back to formal study after an hiatus. It has a fairly rigorous and academic approach to planning, logical thought and reading and writing techniques. However, excellent structure and clear language make it very accessible to secondary teachers wishing to adapt ideas for use with their students.